

PHOENIX GOODYEAR AIRPORT SUPERFUND SITE
Goodyear, Arizona

EXPLANATION OF SIGNIFICANT DIFFERENCES #5

Explanation of Significant Differences to September 1989 Record of Decision
and May 1993 Explanation of Significant Differences #2.

September 2002

I. INTRODUCTION

In 1989, the United States Environmental Protection Agency ("EPA") issued a Record of Decision ("ROD") selecting the final remedy for contamination at the Phoenix-Goodyear Airport ("PGA") North Superfund Site ("Site") in Goodyear, Arizona. This Explanation of Significant Differences ("ESD") reestablishes that the air emissions control mechanism for the soil gas remedy under the ROD as granular activated carbon ("GAC") for the northern portion of the PGA Site - PGA-North.¹ In 1993, EPA issued an ESD which altered the ROD's soil gas remedy for PGA-North from treatment of air emissions from the Soil Vapor Extraction ("SVE") system from GAC to treatment by thermal oxidation ("thermox"). The SVE system with thermox functioned for four years, but was shut off for reevaluation in 1998 and has not been restarted due to community concerns regarding potential dioxin emissions from the thermox treatment unit. Due to current Site conditions, including high levels of residual soil gas contamination and increased spread of Site groundwater contamination, this ESD returns the soil gas remedy to SVE using GAC.

¹ The soil gas remedy at the southern portion of the PGA Site was closed out in 1999. See Polygon 96/92/27A Closure Report: Phoenix Goodyear Airport South (1999). Accordingly, this ESD only applies to the PGA-North soil gas remedy.

Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA"), as amended, and 40 C.F.R. Section 300.435(c)(2)(i) (55 Fed Reg. 8666, 8852 (March 8, 1980)), require EPA to publish an ESD when significant, but not fundamental, changes are being considered to a final remedy plan as described in a ROD. If changes to a ROD would fundamentally alter the scope, performance or cost of the selected remedy, a ROD amendment is required. 40 C.F.R. Section 300.435(c)(2)(ii). EPA is issuing this ESD to provide notice of modifications to the 1989 ROD and ESDs subsequent thereto which significantly, but do not fundamentally, affect the selected remedy. Because this ESD does not propose a fundamental change to the remedy in the 1989 ROD with respect to scope, performance or cost, no formal public comment period is required. 40 C.F.R. §300.435(c)(2)(i).

This ESD and supporting documentation will become part of the PGA Administrative Record. Copies of the Administrative Record for the PGA Site including this ESD have been placed at the following locations:

Avondale Public Library
328 West Western Avenue
Avondale, AZ 85323
(602) 932-9415

EPA Region 9 Superfund Records Center
95 Hawthorne Street - Suite 403S
San Francisco, California 94105
(415) 536-2000

If additional information becomes available, EPA will revise the Administrative Record to reflect such material.

EPA has made this ESD and supporting information available to the public through the Administrative Record and information repository for the PGA Site. Additionally, EPA is

publishing a notice in the Arizona Republic, the West Valley View, and Prensa Hispana that briefly summarizes the ESD and announces its availability for review. In accordance with 40 C.F.R. Section 300.515(h)(3), EPA has provided a fifteen day comment period for the State of Arizona. The State's comments on this ESD are summarized in Section IV of this document and are also included in the Administrative Record.

II BACKGROUND

The following provides a brief background of the PGA Site, the 1989 ROD and subsequent relevant ESDs. Because this ESD only pertains to PGA-North, the background will focus only on PGA-North contamination and cleanup.

A. Site Background and Description

The PGA site is located in Goodyear, Arizona, approximately seventeen miles west of Phoenix in the western part of the Salt River Valley. The PGA site was divided into a northern and southern portion when Site investigation determined that there were separate contaminant source areas.

PGA-North consists of the Unidynamics property, located at 102 S. Litchfield Road, and all areas with groundwater contamination in excess of site clean-up standards related to and emanating from that property. Attachment 1 to this ESD provides a map indicating the approximate boundaries for the entire PGA Superfund site. Current land uses on and near the Site are agricultural, industrial, and residential.

Solvent contamination was first discovered in certain areas of the Site by the Arizona Department of Health Services ("ADHS") in 1981. During the following two years, EPA and ADHS sampled area wells, revealing trichloroethylene ("TCE") contamination in 18 agricultural,

private and City supply wells in the Goodyear area. Other hazardous substances found at PGA-North during initial investigation include acetone, methyl ethyl ketone ("MEK"), 1,1,1-trichloroethane ("TCA"), tetrachloroethylene (PCE), and other VOCs. EPA added the PGA site to the National Priorities List ("NPL") on September 8, 1983. (Federal Register, Vol. 48, No. 175, p. 40671 (originally listed as "Litchfield Airport Area Superfund Site")).

A single ROD was produced for both the northern and southern portions of the PGA site and was signed by the EPA Regional Administrator on September 26, 1989.² The selected remedy for PGA-North is a pump and treat system for groundwater contamination in the A and C Subunits and an SVE system with emissions controls for the vadose zone.³ Remedial action at PGA-North is being carried out by Unidynamics-Phoenix, Inc., through its parent company Crane Corporation ("Crane Co."), under a 1990 Unilateral Administrative Order. EPA, with the assistance of Arizona Department of Environmental Quality ("ADEQ"), authorizes and oversees all cleanup activities at the Site.

B. Soil Gas Remedy at PGA-North

a. Soil Gas Remedy Selection

The remedy selected in the ROD for contaminated soil gas at PGA-North was implementation of an SVE system with vapor-phase GAC air emission controls in the contamination target areas. "Target areas" are those areas where VOCs were detected in soil

² Groundwater and soil contamination at the southern portion of the site was originally addressed through a ROD of the Section 16 Operable Unit, which was signed on September 29, 1987. The remedy selected in the Section 16 ROD was determined to be consistent with that designated for the entire site in the 1989 ROD.

³The ROD's designated remedy for PGA-South is treatment of Subunit B/C groundwater and operation of an SVE system with emissions control for the vadose zone. Remediation at PGA-South has been conducted by the Goodyear Tire and Rubber Company.

samples at levels higher than 1 microgram per liter (see Attachment 2). The ROD provides that the identified target areas may be expanded or reduced, as necessary, in order to remove 99 percent of the contaminants from the soil. Additionally, the ROD provides that, where SVE is not wholly effective, excavation and treatment of the soils may be required.

The cleanup standard for VOC contamination in Site soils, as identified in the ROD and ESD #2, is the removal of contaminants from Site soils “until EPA is convinced the levels remaining will not cause or contribute to groundwater contamination in excess of the cleanup standard for groundwater.” The cleanup level for TCE at the Site is 5 micrograms per liter.

To determine the impact of soil contamination on groundwater, EPA utilizes modeling to determine the quantity of leachate from soil contamination impacting the groundwater. The modeling is based upon VOC vapor samples taken from soil vapor monitoring wells and conversion of those soil vapor concentrations to total soil concentrations. To determine leachate generation potential, EPA uses a VLEACH model, and the resultant groundwater impact from the leachate is modeled using Mixcell.

EPA has issued four prior ESDs altering the remedy selected in the ROD. Two of those ESDs are relevant to this ESD. In January 1991, ESD #1 identified the PGA-North soil contamination target areas and clarified that soil excavation was one of a number of potential remedial options, rather than the sole option, should the SVE remedy ultimately be unsuccessful. In May 1993, EPA modified the ROD again through an ESD #2, which changed the air emissions control from GAC to thermox with wet scrubbing.

b. Soil Gas Remedial Design

In 1991 and 1992, under EPA oversight, Unidynamics designed the soil gas remedy as

described in the ROD. In late 1991, Unidynamics installed two SVE extraction wells within the ROD-designated target areas. During testing for contaminant concentrations and pressure data, soil gas samples were collected that showed levels of TCE at an average level of 475 parts per million ("ppm"), acetone at an average level of 299 ppm, and MEK at an average level of 1477 ppm. Based on the high level of contaminants found in these initial tests, estimates revealed that 4,000 pounds per day of GAC would be required to treat the air emissions from the SVE system. The high quantities caused Unidynamics concern regarding the overall cost of the remedy and the safety of transport of the potentially combustible GAC from the system for disposal. Additional concerns were raised regarding potential spontaneous combustion of the GAC canisters when used for treatment of the MEK and acetone that were detected in the soils. Accordingly, Unidynamics evaluated several SVE emissions control technologies, the results of which were contained in Evaluation of Alternatives for Treatment of Extracted Soil Vapor During SVE Pilot Testing (March 13, 1992).

In December 1992, EPA approved a pilot test of thermox of the SVE by-products with wet scrubbing. At that time, thermox was considered a demonstrated technology for treatment of soil contaminated with VOCs with a 99% destruction efficiency. Thermox eliminated the need to dispose of and regenerate large volumes GAC canisters, thereby reducing the cost of disposal and eliminating potential hazards inherent in transporting hazardous waste. After pilot testing in May 1993, EPA approved the use of thermox with a wet scrubber unit as vapor treatment for the SVE system, and documented that decision in ESD #2.⁴

⁴ PGA-South established an SVE system with air sparging at three different locations between March 1996 and April 1998. In April 1998, it was determined that soil remediation goals had been reached. This determination was confirmed with soil vapor rebound monitoring

c. Implementation of Soil Gas Remedy at PGA-North

Pursuant to ESD #2, Unidynamics constructed an SVE system utilizing thermox with wet scrubbing for emissions control. The SVE system was completed in 1994 and operated for approximately four years. During that time, the SVE system removed approximately 10,000 pounds of VOCs from the soils. However, from 1995 to 1998, the thermox treatment unit experienced numerous technical difficulties, including overheating, which required a number of system shut-downs. The entire SVE system was shut down for overall reevaluation in November 1998.

Following the shutdown of the thermox system, community concerns were raised regarding potential dioxin emissions from using a thermox unit to treat SVE emissions. The community expressed concern regarding the dioxin emissions and what was perceived as a lack of community notification regarding the treatment technology.

Due to these concerns, in March 2000, EPA briefed the City of Goodyear ("City") regarding the option of restarting the SVE system utilizing GAC instead of thermox. The City reiterated community opposition to the use of thermox, and requested, should EPA restart the SVE system, that all test results be provided to the public prior to full-scale system startup. In September 2001, EPA notified the City explaining that EPA would direct the restart of the SVE system with GAC in order to protect the groundwater from further contamination. On September

from April through July 1998, and by final closure sampling in September of that year. During its operation, PGA-South's SVE system removed 1,768 pounds of chlorinated solvents, including TCE, from the area. (For details, see Polygon 96/92/27A Closure Report: Phoenix Goodyear Airport South (1999)). Closure was granted at PGA-South for the SVE remedy after monitoring values were inserted into the VLEACH and Mixcell models to determine that groundwater impact from soil contamination was less than five micrograms per liter.

25, 2001, the City of Goodyear indicated its support for the SVE system provided that adequate background evaluations were conducted.

During June 2002, EPA collected soil gas samples from the six multi-tier soil vapor monitoring probes adjacent to the SVE wells on the Unidynamics property. The testing detected high concentrations of TCE in all six probes, PCE in one probe, and no MEK or acetone in any probes (above the detection limit of 1 ug/l (microgram per liter). The maximum concentrations in parts per million by volume (ppmv) detected for TCE and PCE are shown in the table below.

Maximum Concentrations in Soil Vapor Monitor Wells - PGA North - June 2002

Monitor well	TCE (ppmv)	PCE (ppmv)	MEK (ppmv)	Acetone (ppmv)
SVM-1	1,200	19	ND	ND
SVM-2	580	ND	ND	ND
SVM-3	200	ND	ND	ND
SVM-4	350	ND	ND	ND
SVM-5	110	ND	ND	ND
SVM-6	540	ND	ND	ND

Further analysis has confirmed that VOC contaminant concentrations in the soils are high enough to continue to pose a considerable threat to groundwater requiring continued remedial action at the Unidynamics property. A more detailed chart comparing the TCE concentrations detected during 1996, 1997, and 2002 at various depths in each of the six soil vapor monitoring probes is depicted on Attachment 3.

III. DESCRIPTION OF ESD #5

This ESD returns the soil gas remedy for PGA-North to an SVE system utilizing GAC for

emissions control as originally chosen in the 1989 ROD. Although in June 2002 no ketones were detected above the detection limits, as a conservative measure, the GAC treatment unit will be designed with a fire protection system which will be activated based on carbon dioxide and/or carbon monoxide monitoring in case ketones are captured by the SVE system. The cost to restructure the SVE system for GAC emissions control will likely be less than to revitalize the current thermox system.

GAC is a proven technology for capturing air emissions from SVE systems, with an efficiency rate of near 100%, it is capable of removing TCE to below air emission limits. It is also approved as BACT (Best Available Control Technology) by the Maricopa County Air Pollution Board (APB). Additionally, utilization of a GAC system allays community concerns regarding dioxin emissions from the thermox system.

EPA anticipates that, based on the use of GAC, the remedy will cost approximately \$40,000 for system reconfiguration (with a leased vendor-supplied GAC unit) and, at a minimum, \$170,000 (including cost of carbon) annually for system operation and maintenance (O&M). To rehabilitate the thermox system would cost, at a minimum, \$75,000 and annual O&M costs would run, at a minimum, \$50,000 (assuming the thermox system were operated similarly to its operation during the 1990s).

The annual O&M costs for the GAC unit are estimated to be higher to operate than the O&M costs for thermox due to the collection of VOCs in spent carbon canisters which must be disposed ⁵ or regenerated at an EPA-approved treatment, storage and disposal facility. ⁵

⁵ Due to the inability to predict the approximate mass of contaminant in the vadose zone beneath the Unidynamics facility, GAC consumption was calculated using historical influent TCE concentrations collected during operation of the thermox system. As a result, and based on

However, the annual O&M costs for thermox treatment could be underestimated for the following reasons: (1) the price has increased for propane or natural gas, which is needed to burn the contaminated gas vapors; (2) the projected flow rate of 150 cubic feet per minute (cfm) is higher than the actual flow rate when the thermox treatment unit was operating; and (3) the sampling and monitoring costs could be higher because of the public scrutiny and concern about potential formation of dioxin in the gas emissions from incomplete combustion of the gases.

Issues raised in the 1993 ESD #2 regarding disposal of large quantities of carbon are no longer relevant because the prior carbon usage estimates of 4,000 pounds per day of carbon were based on worst-case soil gas concentrations, prior to initiating the 1992 SVE pilot study. Current 2002 estimates for carbon usage are in the range of 100 pounds per day, and worst-case estimates are not more than 250 pounds per day, even were the SVE extraction system to be significantly expanded or the flow to be greatly increased.

The SVE system with GAC emissions will be operated until the VLEACH test indicates the soil gas is no longer impacting the groundwater above cleanup standards. With the present quantity of contaminants detected in the soil gas, it is expected that the system will operate at a minimum for one year. However, because there was insufficient collection of soil vapor monitor probe data and operational data during the period the thermox treatment unit was operating, the actual time needed to remove sufficient VOCs to meet the VLEACH test requirements is unknown.

Because the remedy merely returns to the original soil gas remedy in the 1989 ROD in

recent soil gas sampling data, costs associated with annual O&M of a GAC unit may be significantly higher than what is presented.

order to meet the original cleanup standards, this ESD does not present a fundamental change in the performance or scope of the remedy.

IV. SUPPORT AGENCY COMMENTS

As required by 40 C.F.R. §300.515(h)(3), EPA has provided ADEQ an opportunity to review and comment on these changes to the 1989 ROD and 1993 ESD. ADEQ supports EPA issuing this ESD. Furthermore, due to public concern regarding dioxin emissions from the thermox system, EPA has provided the City of Goodyear with an opportunity to review and comment on the changes, and the City supports the changes as well.

V. STATUTORY DETERMINATIONS


Where a remedial action is being taken that differs significantly from that determined in a ROD, but does not fundamentally alter the chosen remedy in scope, performance or cost, the lead agency must consult with support agencies and produce and publicize an ESD explaining the changes. This ESD does affect the form and cost of the current soil gas remedy for PGA-North, but it does not fundamentally alter the scope, performance or cost of the remedy.

This ESD returns the soil gas remedy to that selected in the ROD from the alterations made by ESD #2, but the remedy remains otherwise unchanged. This remedy is protective of human health and the environment. The change does affect the scope and performance of the remedy as last articulated, and thus it is significant. This ESD does not, however, fundamentally alter the remedy selected in the ROD with respect to scope, performance or cost.

VI. PUBLIC PARTICIPATION ACTIVITIES

Pursuant to 40 C.F.R. §300.435(c)(2)(i), a formal public comment period is not required for an ESD to a ROD when the difference does not fundamentally alter the remedy selected in the

ROD with respect to scope, performance or cost. This ESD does not propose a fundamental change to the remedy in the ROD with respect to scope, performance or cost, and therefore, no formal public comment period is required. EPA has made this ESD and supporting information available to the public through the Administrative Record and information repository for the PGA Site. Additionally, due to public interest, EPA has participated in Community Advisory Group (CAG) meetings and published several fact sheets intended for the public to learn about the changes set forth in this ESD. EPA is publishing a notice in the Arizona Republic, the West Valley View, and the Prensa Hispana that briefly summarizes the ESD, including the reasons for such differences, and that announces its availability for review.



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9-19-02

Date

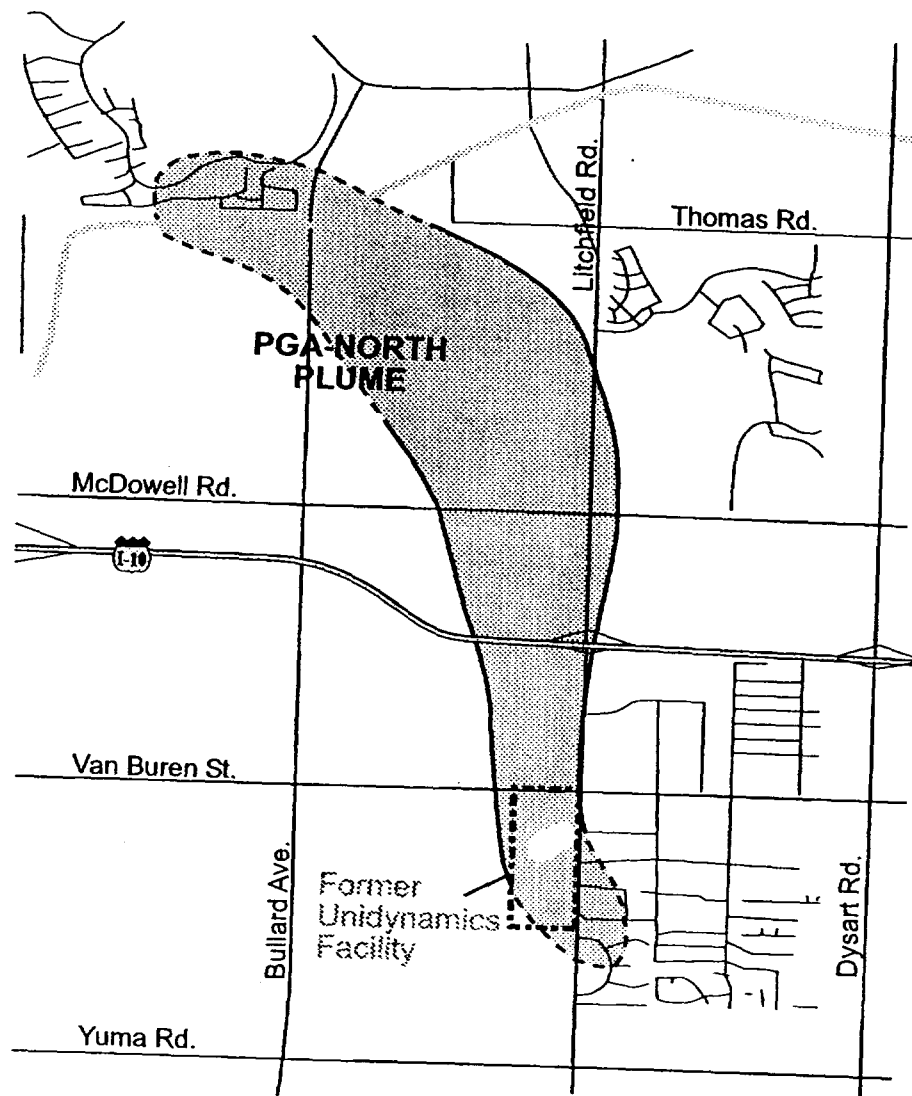
Attachments:

1. Map Showing Location of PGA North Superfund Site
2. Map Showing VOC Target Areas Identified in ROD
3. Summary of TCE Soil Vapor Well Monitor Results for 1996, 1997 and 2002

Attachment 3


Summary of TCE Soil Vapor Monitor Well Results Phoenix, Goodyear Airport, Unidynamics Facility

VMW Location Depth	TCE (ug/L) Nov 1996	TCE (ug/L) Dec 1997	TCE (ug/L) June 2002
SVM-1-10	19	0.8	32
SVM-1-20	5.2	1.1	140
SVM-1-30	23	110	690
SVM-1-40	1200	4300	2400
SVM-1-50	1600	4100	6400
SVM-2-10	5	1.1	41
SVM-2-20	1.7	0.6	160
SVM-2-30	480	24	980
SVM-2-40	1500	4500	3100
SVM-2-50	1800	3900	370
SVM-3-10	450	5	67
SVM-3-20	250	2.6	170
SVM-3-30	160	22	370
SVM-3-40	1300	3200	1100
SVM-3-50	3600	3600	1400
SVM-4-27.5	410	280	210
SVM-4-43	660	2000	590
SVM-4-53	800	1900	820
SVM-4-60	880	2800	920
SVM-4-74	1100	3100	1900
SVM-5-27.5	75	2.6	140
SVM-5-43	720	190	300
SVM-5-53	780	230	590
SVM-5-60	710	250	570
SVM-5-74	560	24	440
SVM-6-27.5	5.2	71	10
SVM-6-43	110	2100	21
SVM-6-53	240	2700	29
SVM-6-60	260	2300	32
SVM-6-74	250	2600	23



LEGEND

Area of known soil contamination

 Estimated extent of groundwater contamination, exceeding the maximum contaminant level for TCE ($5\mu\text{g/L}$) dashed where inferred (approx. 70-130 feet underground)

0 0.5 1
Scale in Miles

FIGURE 1
NORTHERN AREA OF PGA
SUPERFUND SITE
PHOENIX GOODYEAR AIRPORT
SUPERFUND SITE

EPA does not consider surface areas above the contaminated groundwater that are outside of the source area and that are not used for remediation activities as part of the Superfund site.

